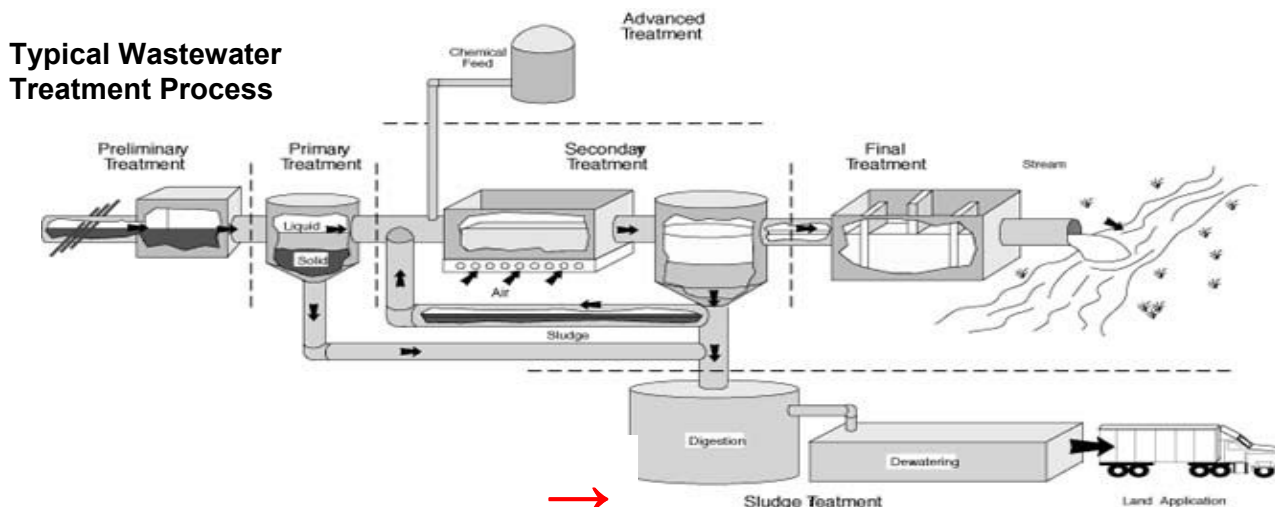


March 17, 2006

Vol. I, 2006

## Urban Wastewater Systems *(continued)*

### Sludge Treatment Processes:



**Sludges** generated through the sewage treatment process must go through **sludge treatment** to stabilize the sludge and reduce odors, remove some of the water and reduce volume, decompose some of the organic matter and reduce volume, kill disease causing organisms, and disinfect the sludge prior to **land application**.

The second of the three main types of sludge treatment in Michigan is **Aerobic Digestion**.

Aerobic bacteria are very efficient in breaking down waste products. As a result, aerobic treatment usually yields better effluent quality than that obtained in anaerobic processes. The aerobic pathway (see Figure) also releases a substantial amount of energy. A significant fraction, thereof, is used by the micro-organisms for synthesis and growth of new micro-organisms. This sharp proliferation in aerobic biomass allows for fast and efficient pollutant removal and ditto response to changes in the wastewater composition. Aerobic digestion is therefore, very useful when high flows of wastewater with variable composition are treated.

The main drawback of aerobic treatment is the production of huge amounts of biosolids (sludge): the mud-like material that remains after the treatment of household and industrial wastewater that flows into sewage treatment plants. Biosolids from an aerobic digestion plant consist mainly of water: 98 to 99.5 % of its weight is water; only 0.5 to 2 % of its weight is dry solid (DS) matter.

Another important drawback of aerobic treatment is the need for aeration, a process which requires significant energy consumption.

*Next week: Lime Stabilization*